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(54) Artificial intervertebral disc.

(57) An artificial intervertebral disc (10) comprising a pair of end bodies (1) which are provided, on their outer surfaces, with apatite layers (4) and a medical synthetic polymeric intermediate (3) which is held between the end bodies (1) through connecting members (2).

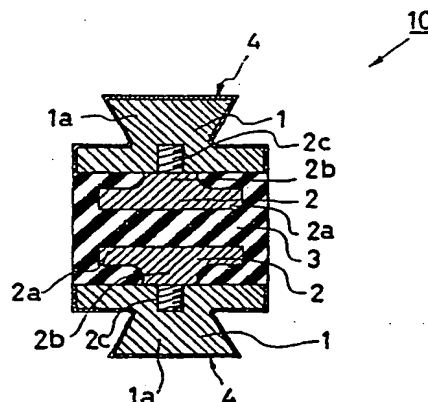


Fig.1

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bodies 1 and the connecting members 2 are not limited to those illustrated in the drawings and can be modified without deviating from the scope of protection of the invention.

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Claims

1. An artificial intervertebral disc (10) comprising a pair of end bodies (1) which are provided, on their outer surfaces, with apatite layers (4) and a medical synthetic polymeric intermediate (3) which is held between the end bodies (1) through connecting members (2).

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2. An artificial intervertebral disc (10) according to claim 1, wherein said end bodies (1) are made of titanium.

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3. An artificial intervertebral disc (10) according to claim 1, wherein said end bodies (1) are made of stainless steel.

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4. An artificial intervertebral disc (10) according to one of claims 1 to 3, wherein said connecting members (2) are made of stainless steel.

5. An artificial intervertebral disc (10) according to one of claims 1 to 3, wherein said connecting members (2) are made of titanium.

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6. An artificial intervertebral disc (10) according to one of claims 1 to 5, wherein said connecting members (2) have screws (2c) for connecting the same to the associated end bodies (1).

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7. An artificial intervertebral disc (10) to be implanted between the vertebral bodies (11), according to one of claims 1 to 6, wherein said end bodies (1) have projections (1a) which can be engaged in the associated vertebral bodies (11).

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8. An artificial intervertebral disc (10) according to one of claims 1 to 7, wherein said medical synthetic polymeric intermediate (3) has an elasticity.

9. An artificial intervertebral disc (10) according to claim 8, wherein said medical synthetic polymeric intermediate (3) is made of a material selected from silicone rubber, polyvinyl alcohol, and polyurethane.

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10. An artificial intervertebral disc (10) according to one of claims 1 to 9, wherein said apatite layers (4) are formed by plasma spraying.

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11. An artificial intervertebral disc (10) according to one of claims 1 to 10, wherein said apatite layers (4) and said end bodies (1) are made of materials having coefficients of thermal expansion substantially identical to each other.

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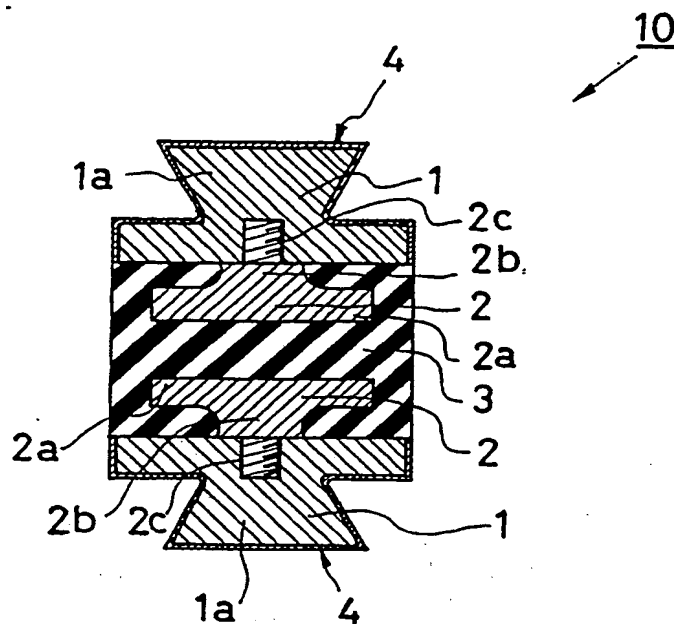


Fig. 1

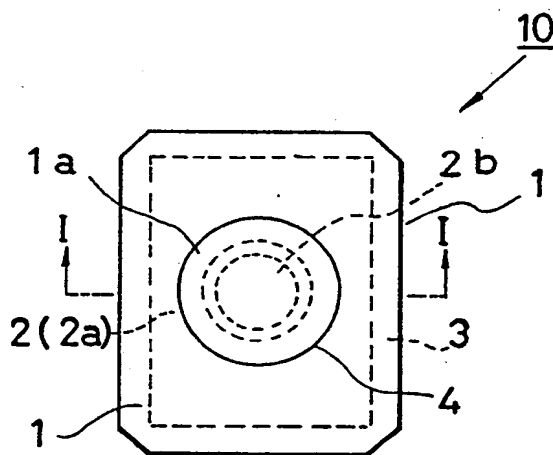


Fig. 2

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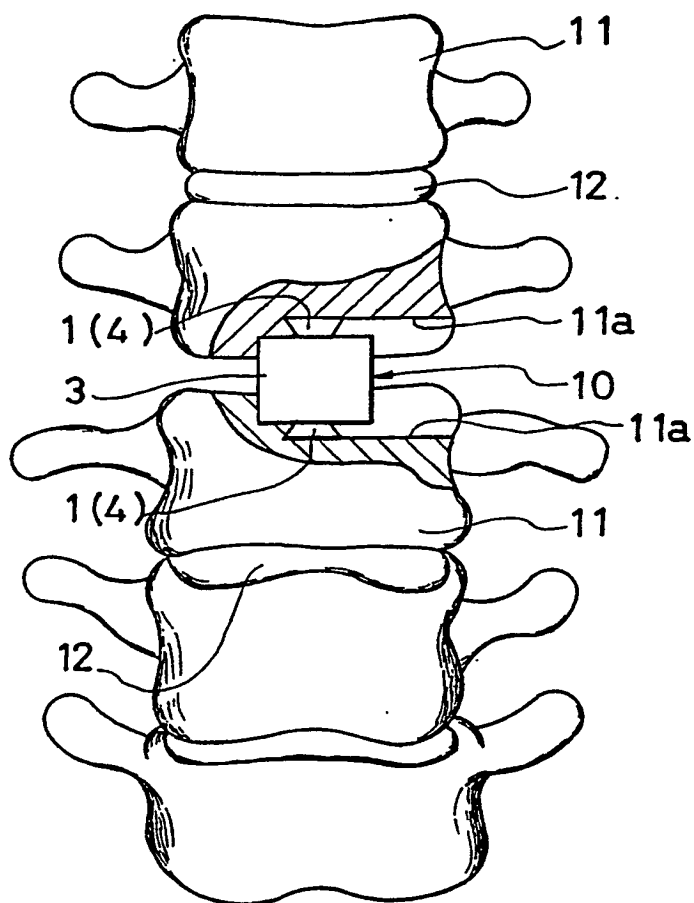


Fig.3



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EUROPEAN SEARCH REPORT

Application Number

EP 88 11 9477

| DOCUMENTS CONSIDERED TO BE RELEVANT | | | |
|---|--|--|---|
| Category | Citation of document with indication, where appropriate, of relevant passages | Relevant to claim | CLASSIFICATION OF THE APPLICATION (Int. Cl.4) |
| A | EP-A-0 176 728 (HUMBOLDT-UNIVERSITÄT) * Page 6, line 27 - page 7, line 14; page 9, lines 5-10; figures 1,2,11,12 * | 1-3,6,7 | A 61 F 2/44 |
| A | US-A-4 553 273 (K. WU) * Column 1, line 51 - column 2, line 24; figures * | 1,4,6 | |
| A | DE-A-2 263 842 (HOFFMANN-DAIMLER) * Page 14, lines 1-4; page 15, line 13 - page 16, line 6; claim 1; figures 1,5 * | 1,8,9 | |
| A | FR-A-2 336 913 (SUMITOMO) * Page 1, lines 1-35; claims 1,13,17 * | 1-3,10 | |
| A | EP-A-0 202 908 (SUMITOMO) * Page 1, lines 2-19; claims 1,6,7 * | 1,2,10 | |
| A | DE-A-2 804 936 (SULZER) * Page 4, line 8 - page 5, line 11; figures 1-4 * | 1,7 | TECHNICAL FIELDS SEARCHED (Int. Cl.4) |
| A | US-A-3 867 728 (STUBSTAD) * Column 7, lines 39-59; column 9, lines 63-67; figures 1-6 * | 8,9 | A 61 F |
| A | US-A-4 044 170 (SCHARBACH) * Column 1, line 53 - column 2, line 35 * | 11 | |
| A | DE-A-3 023 353 (SULZER) | | |
| A | US-A-3 875 595 (FRONING) | | |
| The present search report has been drawn up for all claims | | | |
| Place of search THE HAGUE | | Date of completion of the search 27-02-1989 | Examiner KLEIN C. |
| CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document | | | |

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